

A DEGRADATION STUDY OF
DISLodgeable METHIDATHION RESIDUE ON
ORANGE FOLIAGE IN TULARE COUNTY, CALIFORNIA
DURING MAY - JUNE 1983

By

Keith T. Maddy, Staff Toxicologist
Cynthia M. Au, Environmental Hazards Specialist
Cathy Cooper, Agricultural Chemist

HS-1149 February 1, 1984

California Department of Food and Agriculture
Division of Pest Management, Environmental
Protection and Worker Safety
Worker Health and Safety Unit
1220 N Street, Sacramento, California 95814

SUMMARY

During May and June, a degradation study of dislodgeable methidathion (Supracide) residue on orange foliage was conducted in Tulare County. The safety interval for methidathion on oranges is 30 days. Samples were collected before the application and at 24 hours, 48 hours, 72 hours, 7 days, 14 days, 21 days, and 28 days after the application. None of the sample results exceeded the established thion/oxon safe level value of 0.2 ug/cm². This should not be interpreted as a basis for shortening the safety interval. Instead, this study substantiates that under the conditions of this orange grove and the application rate of the material, the existing safety interval is adequate.

INTRODUCTION

In June 1971, the California Department of Food and Agriculture established safety intervals for specific crop/pesticide combinations. A safety interval is the time period that must elapse between the application of a pesticide and the entry of unprotected workers into the treated area. This waiting period was instituted to allow sufficient time for toxic materials to environmentally degrade to a low toxicity residue level. The adequacy of these safety intervals has not been evaluated since their introduction. This study was proposed to validate existing safety intervals. The objective of this study was to monitor the foliar decay rates of pesticides with safety intervals longer than two days. This study is one of several studies conducted in 1983 for safety interval validation.

Methidathion (Supracide) is a broad spectrum organophosphate insecticide and acaricide. It is effective against a wide variety of pests. It has both contact and stomach action (Vettorazzi, 1979). Methidathion has an oral LD₅₀ (rat) of 20 mg/kg and a dermal LD₅₀ (rat) of 25 mg/kg (NIOSH, 1980).

Knaak and Iwata (1982) established safe level values for methidathion and methidathion-oxon on foliage. These values are 0.6 ug/cm² and 0.15 ug/cm². The combined thion/oxon safe level value has been established at 0.2 ug/cm². These values represent the maximum residue level which would ensure negligible risk to the workers. This study investigated the rate at which the residue levels were met.

METHODS

With assistance from the Tulare County Agricultural Commissioner's staff, growers filing a Notice of Intent to apply methidathion were contacted. Cooperation was obtained from a grower filing a Notice to apply Supracide 2E on oranges. The material was formulated as an emulsifiable concentrate with 24.4% active ingredient. Methidathion has a 30 day safety interval on oranges. The application rate was 7.5 pints/acre (1.87 pounds), with a dilution of one pint to 100 gallons of water.

The orange grove was divided into two areas. The middle row from each area was sampled. Each row was identified with markers for future sampling. Pre-application samples were collected on the day of application. Succeeding post-application samples were taken at 24 hours, 48 hours, 72 hours, 7 days, 14 days, 21 days, and 28 days. Foliar samples were collected using a 2.54 cm disk leaf punch which was cleaned with alcohol between samples. Ten trees from each row were sampled, beginning with the fourth tree in the row. Two leaf punches from each tree were taken while entering the grove and two punches from the adjacent ten trees while exiting the grove. Each sample contained 40 leaf punches. Protective equipment was worn according to worker safety regulations.

All samples were sealed with aluminum foil, capped, and stored on ice. Samples were shipped to Chemistry Laboratory Services in Sacramento for analysis. Dislodgeable residues were removed by mechanically shaking the leaf disks with a water-surfactant solution. The aqueous wash was extracted with ethyl acetate, dried with anhydrous sodium sulfate, and concentrated or diluted as necessary. The analysis was by gas chromatography. Method sensitivity was 0.0005 ug/cm². Weather conditions during the study were hot

and dry with no rainfall. Weather data are presented in Appendix I. Air pollution data are presented in Appendices 2, 3, and 4.

RESULTS

Tables 1 and 2 present the analytical results for methidathion and methidathion-oxon. Sampling was terminated at day 28 because the residue levels were so low and would pose no hazard to workers.

Table 1

Dislodgeable Residue Levels of Methidathion in ug/cm²

TIME	ROW A	ROW B	MEAN
pre-application	ND	ND	ND
24 hours	0.083	0.110	0.097
48 hours	0.030	0.028	0.029
72 hours	0.024	0.018	0.021
7 days	0.0067	0.0099	0.0083
14 days	0.0036	0.0078	0.0057
21 days	0.0160	0.0250	0.0205
28 days	0.0051	0.0042	0.0047

Table 2

Dislodgeable Residue Levels of Methidathion-oxon in ug/cm²

TIME	ROW A	ROW B	MEAN
pre-application	ND	ND	ND
24 hours	0.0009	0.0014	0.0012
48 hours	0.0015	0.0010	0.0013
72 hours	0.0009	0.0006	0.00075
7 days	0.0006	NA	0.0006
14 days	0.0009	0.0007	0.0008
21 days	0.0006	NA	0.0006
28 days	0.0014	0.0010	0.0012

ND = none detected (minimum detectable limit = 0.0005 ug/cm²)

NA = not available

DISCUSSION

None of the sample results exceeded the safe level values established by Knaak and Iwata (1982). This should not be construed as a validation of any argument to shorten the safety interval. Instead, this study only substantiates the existing safety interval as adequate, given the conditions of this orange grove and the application rate of the material. The sample population in this study was too small for the data to be directly applied as a standard for degradation rates. Existing safety intervals were established upon the degradation of maximum label application rates. To minimize cost and pest resistance to the material, growers usually will not apply maximum rates. Several factors such as, ambient and radiant temperature, humidity, and solar radiation may influence the degradation of pesticides. These factors were not within the scope of this study to measure and were not taken into account. Future studies incorporating more comprehensive monitoring capabilities will be necessary before any action can be considered to shorten safety intervals. However, under these conditions, there is no need to increase the interval either.

REFERENCES

1. Vettorazzi, G., International Regulatory Aspects for Pesticide Chemicals, CRC Press, Inc., Vol. 1, p. 72, (1979).
2. NIOSH, 1979 Registry of Toxic Effects of Chemical Substances, Vol. 2, p. 286, (1980).
3. Knaak, J. B. and Y. Iwata, The Safe Level Concept and the Rapid Field Method, 182, ACS Symposium Series pp. 23-39, (1982).

APPENDIX I

WEATHER DATA

TEMPERATURE
IN °F

DAY	HIGH	LOW
May 24	98	65
	95	65
	96	69
	101	68
	101	71
	100	60
	91	58
	90	58
June 1	85	54
	78	54
	80	54
	86	58
	90	63
	95	64
	100	70
	100	66
	93	62
	92	63
	94	60
	82	55
	87	59
	96	60
June 15	103	61
	92	62
	97	62
	100	59
	87	56
	90	58
	93	60

APPENDIX III

CALIFORNIA AIR RESOURCES BOARD
BASIC TAB REPORT

POLLUTANT : 44201 : OZONE
COLLECTION METHOD : 14 : INSTRUMENTAL
ANALYSIS METHOD : UV PHOTOMETRIC
UNITS : 40 : PPHM

HOUR (PST)

AIR BASIN : 09 : SAN JOAQUIN VALLEY
STATION : 5400568 : VISALIA-CHURCH STREET
AGENCY : A : ARB-ATMOSPHERIC SURV
PROJECT : 11 : POPULATION ORIENTED

MAY : 1983 : 1983

DAY	HOUR (PST)												MAXIMUM																		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVE CONC	N CONC HR	M				
1X	2	2	2	2	2	1	1	3	4	4	4	5	5	5	4	4	4	5	5	5	5	4	4	5	2.0	23	5	13 M			
2	2	1	1	1	1	1	2	2	3	4	5	5	6	7	6	6	5	4	3	3	3	2	1	2	3.1	23	6	16			
3	2	2	2	2	1	1	1	1	2	2	2	3	3	3	4	4	4	5	5	5	5	4	4	5	2.6	22	7	14 M			
4	1	1	1	1	3	3	2	2	2	3	3	3	4	4	4	5	5	5	5	5	5	4	4	5	2.4	21	5*	16			
5	3	3	2	2	2	2	2	2	2	2	2	2	3	4	4	4	5	5	5	5	5	4	4	5	2.5*	16	4*	16			
6	2	3	2	2	2	2	2	2	2	2	2	2	3	4	4	4	5	5	5	5	5	4	4	5	3.4	23	5	11 M			
7X	0	0	0	0	0	0	1	1	2	2	3	4	4	4	4	4	5	5	5	5	5	4	4	5	3.5	23	6	12 M			
8X	2	2	2	2	2	2	1	1	2	2	2	3	4	4	4	4	5	5	5	5	5	4	4	5	3.6	23	6	14 M			
9	2	2	2	2	2	2	1	1	2	2	2	3	4	4	4	4	5	5	5	5	5	4	4	5	3.0	21	5	13 M			
10	2	2	2	2	2	1	1	1	2	2	2	3	4	4	4	4	5	5	5	5	5	4	4	5	2.7	23	5	14 M			
11	2	2	2	2	2	3	1	2	2	2	3	4	4	4	4	5	5	5	6	6	6	6	6	5	3.2	23	6	16 M			
12	2	2	2	2	2	2	1	1	2	2	3	4	4	4	4	5	5	6	6	6	6	6	6	5	3.5	22	7	16 M			
13X	2	2	2	2	1	1	1	2	2	2	3	4	4	4	4	5	5	6	6	7	7	7	7	6	3.2*	20	7*	12 M			
14X	1	1	1	1	2	2	1	1	2	2	2	3	4	4	4	5	5	6	7	7	7	7	7	6	4.3	23	8	13 M			
15X	2	2	2	2	1	1	1	1	2	2	2	3	4	4	4	5	5	6	6	6	6	6	6	5	4.1	23	8	12 M			
16	3	3	2	2	2	2	2	2	2	2	3	4	4	4	5	5	6	6	7	7	7	7	7	6	3.9	22	7	14 M			
17	4	4	4	4	4	4	4	4	4	4	5	5	6	6	6	6	6	7	7	7	7	7	7	6	4.0	23	7	16 M			
18	4	4	4	4	5	5	5	5	6	7	8	7	8	7	8	7	8	8	8	8	8	8	8	7	4.6	23	8	12 M			
19	4	4	4	4	5	5	5	5	6	7	7	8	7	8	7	8	8	8	8	8	8	8	8	7	5.4	22	8	12 M			
20	2	2	3	3	3	3	2	2	2	3	2	3	2	3	2	3	2	3	2	3	2	3	2	4	4.2	23	8	12 M			
21X	4	5	5	5	5	5	4	5	5	6	7	8	9	10	9	10	10	10	10	10	10	10	10	9	3.5	21	6	14 M			
22X	4	5	5	5	5	5	2	2	2	3	5	6	7	8	9	9	9	9	9	9	9	9	9	8	3.0	21	6	14 M			
23	3	3	3	3	2	2	1	1	2	3	4	5	6	7	8	9	10	9	10	10	9	7	6	4.4	23	10	17 M				
24	4	5	2	2	3	2	1	2	3	4	5	6	7	8	9	8	9	10	9	10	9	7	4	4	4	23	10	14 M			
25	4	5	3	2	2	3	2	1	2	3	4	5	6	7	8	9	10	10	10	10	10	10	8	5	4	3	5.9	23	10	14 M	
26	5	4	2	3	3	1	2	2	2	4	5	6	7	8	9	10	11	10	10	10	12	11	11	10	5	3	4	6.4*	21	12*	17
27	4	4	3	3	3	1	2	2	3	4	5	6	7	8	9	10	11	11	12	12	12	11	11	10	6	3*	20	12*	15		
28X	4	4	4	3	3	1	2	2	3	4	5	6	7	8	9	9	9	9	9	9	9	9	9	8	6	5	5	23	12	14 M	
29X	3	3	3	3	2	1	1	2	2	3	4	5	6	7	8	9	9	9	9	9	9	9	9	8	4.9	23	9	14 M			
30X	4	4	3	2	1	2	3	4	4	5	6	7	7	7	7	7	7	7	7	7	7	7	7	6	4.5	23	8	17 M			
31	2	2	2	2	2	2	2	2	2	3	3	4	5	6	6	6	6	6	6	6	6	6	5	3	3.5	21	6	14 M			
Ave	2.7	2.2	1.7	2.0	1.5	2.5	3.6	5.4	6.1	6.8	6.9	7.0	7.2	7.0	7.0	7.2	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	4.2	7.7					
N	31	31	31	31	31	26	27	30	30	30	30	30	30	30	30	30	27	26	26	31	31	31	31	31	31	31	31	690	31		
MAX	5	5	5	3	3	3	7	4	6	8	9	10	11	11	12	12	12	12	12	12	12	12	12	12	12	12	12	RUN DATE	01/10/84		

CALIFORNIA AIR RESOURCES BOARD
BASIC TAB REPORT

POLLUTANT : 44201 : OZONE
COLLECTION METHOD : 14 : INSTRUMENTAL
ANALYSIS METHOD : 40 : UV PHOTOMETRIC
UNITS : PPHM

HOUR (PST)

AIR BASIN : 09 : SAN JOAQUIN VALLEY
STATION : 5400568 : VISALIA-CHURCH STREET
AGENCY : A : AER-ATMOSPHERIC SURV
PROJECT : 11 : POPULATION ORIENTED
JUNE : 1983 :

DAY	MAXIMUM												AVE	N	CONC	HR								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	2	2	2	2	2	2	2	2	2	3	4	5	5	5	6	6	6	6	6	6	6	6	6	6
2	3	2	2	2	1	1	2	2	2	3	4	5	6	6	6	6	6	6	6	6	6	6	6	6
3	2	2	2	2	1	1	2	2	2	3	4	5	6	6	6	6	6	6	6	6	6	6	6	6
4X	2	2	2	2	2	2	2	2	3	4	5	6	6	6	6	6	6	6	6	6	6	6	6	6
5X	2	2	2	2	2	2	2	2	3	4	5	6	6	6	6	6	6	6	6	6	6	6	6	6
6	4	4	4	4	4	4	4	4	4	5	6	6	6	6	6	6	6	6	6	6	6	6	6	6
7	5	5	5	5	5	5	5	5	5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
8	5	5	5	5	5	5	5	5	5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
9	5	5	5	5	5	5	5	5	5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
10	2	2	2	2	2	2	2	2	2	3	4	5	6	6	6	6	6	6	6	6	6	6	6	6
11X	1	1	1	1	1	1	1	1	1	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3
12X	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
13	2	2	2	2	2	2	2	2	2	3	4	5	6	6	6	6	6	6	6	6	6	6	6	6
14	2	2	2	2	2	2	2	2	2	3	4	5	6	6	6	6	6	6	6	6	6	6	6	6
15	2	2	2	2	2	2	2	2	2	3	4	5	6	6	6	6	6	6	6	6	6	6	6	6
16	3	3	3	3	3	3	3	3	3	4	5	6	6	6	6	6	6	6	6	6	6	6	6	6
17	4	4	4	4	4	4	4	4	4	5	6	6	6	6	6	6	6	6	6	6	6	6	6	6
18X	2	2	2	2	2	2	2	2	2	3	4	5	6	6	6	6	6	6	6	6	6	6	6	6
19X	2	2	2	2	2	2	2	2	2	3	4	5	6	6	6	6	6	6	6	6	6	6	6	6
20	2	2	2	2	2	2	2	2	2	3	4	5	6	6	6	6	6	6	6	6	6	6	6	6
21	4	4	4	4	4	4	4	4	4	5	6	6	6	6	6	6	6	6	6	6	6	6	6	6
22	3	3	3	3	3	3	3	3	3	4	5	6	6	6	6	6	6	6	6	6	6	6	6	6
23	3	3	3	3	3	3	3	3	3	4	5	6	6	6	6	6	6	6	6	6	6	6	6	6
24	2	2	2	2	2	2	2	2	2	3	4	5	6	6	6	6	6	6	6	6	6	6	6	6
25X	3	3	3	3	3	3	3	3	3	4	5	6	6	6	6	6	6	6	6	6	6	6	6	6
26X	4	4	4	4	4	4	4	4	4	5	6	6	6	6	6	6	6	6	6	6	6	6	6	6
27	2	2	2	2	2	2	2	2	2	3	4	5	6	6	6	6	6	6	6	6	6	6	6	6
28	2	2	2	2	2	2	2	2	2	3	4	5	6	6	6	6	6	6	6	6	6	6	6	6
29	2	2	2	2	2	2	2	2	2	3	4	5	6	6	6	6	6	6	6	6	6	6	6	6
30	2	2	2	2	2	2	2	2	2	3	4	5	6	6	6	6	6	6	6	6	6	6	6	6
AVE	2.6	2.5	1.7	1.9	2.8	3.0	4.0	4.0	4.0	5.0	6.0	7.0	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
N	30	30	30	30	30	29	29	28	29	29	28	29	29	29	29	29	29	29	29	29	29	29	29	29
MAX	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4

RUN DATE : 01/10/84

APPENDIX III

CALIFORNIA AIR RESOURCES BOARD
BASIC AIR REPORT

POLLUTANT : 42603 : OXIDES OF NITROGEN
 COLLECTION METHOD : 14 : INSTRUMENTAL
 ANALYSIS METHOD : 40 : CHEMILUMINESCENT
 UNITS : ppm

AIR BASIN : 09 : SAN JOAQUIN VALLEY
 STATION : 5400568 : VISALIA-CHURCH STREET
 AGENCY : A : ARE-ATMOSPHERIC SURVEY
 PROJECT : 11 : POPULATION ORIENTED
 MAY : 1953

HOUR (PST)

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MAXIMUM					
																									AVE	CONC	N CONC HR			
1X	2	2	2	1	2	2	2	1	2	2	2	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2.0	23	3	20	
2	2	2	2	3	6	6	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2.4	23	6	66	
3	2	2	2	2	5	2	3	2	2	2	2	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2.0	22	3	55	
4	2	2	1	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	4	4	4	4	4	4	4	3.5	22	5	21	
5	2	2	2	1	2	3	3	2	2	2	2	2	1	2	2	2	2	2	5	5	5	5	5	5	5	3.5	15	3	65	
6	2	2	2	3	5	3	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2.5	23	4	21	
7X	2	2	2	4	4	2	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2.5	23	4	25	
8X	1	1	1	1	1	1	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2.5	23	3	29	
9	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2.5	23	5	21	
10	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2.5	23	5	21	
11	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2.5	23	5	21	
12	2	2	3	2	1	2	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2.5	23	4	25	
13	1	1	2	1	2	2	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2.5	23	5	20	
14X	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	2.0	23	3	29
15X	2	3	2	3	2	2	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2	2	2	2	2	1.7	23	3	21	
16	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.8	22	3	26	
17	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2.2	23	4	29	
18	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.8	23	5	20	
19	1	1	1	2	1	2	1	2	1	2	1	2	1	1	1	1	1	1	2	1	2	1	2	1	2	1.8	23	5	25	
20	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2.0	23	4	19
21X	2	2	3	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2	1.6	23	3	21
22X	2	2	2	1	1	2	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2	1.5	23	4	25
23	1	1	1	1	1	2	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2.1	23	4	35
24	2	2	1	2	2	2	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	2.1	23	4	35
25	2	2	1	2	2	2	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	2.1	23	4	35
26	1	1	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1.8	22	3	24
27	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2.1	23	4	24
28X	2	2	1	1	1	2	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2.0	23	5	24
29X	1	1	1	1	1	1	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2	1.6	23	3	24
30X	1	1	1	1	1	1	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2	1.6	23	3	25
31	1	1	1	1	1	1	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2	1.9	21	2	25
Avg	1.8	1.7	2.0	2.6	2.7	2.0	2.5	2.0	1.8	1.6	1.3	1.3	1.4	1.4	1.4	1.4	1.4	1.4	2.7	2.7	2.7	2.7	2.7	2.7	2.0	3.5	31	31	31	
Max	4	4	5	3	4	6	5	3	5	3	5	3	5	3	5	3	5	3	5	3	5	3	5	3	5	3	2.5	31	31	31

CALIFORNIA AIR RESOURCES BOARD
PASIC TAB REPORT

POLLUTANT : 42603 : OXIDES OF NITROGEN
 COLLECTION METHOD : 14 : INSTRUMENTAL
 ANALYSIS METHOD : 40 : CHEMILUMINESCENT
 UNITS : PPHM

AIR BASIN : 09 : SAN JOAQUIN VALLEY
 STATION : 5400568 : VISALIA-CMCHURCH STREET
 AGENCY : A : ARB-ATMOSPHERIC SURV
 PROJECT : 11 : POPULATION ORIENTED
 JUNE : 1983 :

HOUR (PST)

DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MAXIMUM					
																									N	CONC	%			
1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
2	2	2	1	2	2	3	4	3	2	2	2	2	2	2	2	2	2	3	4	4	4	4	4	4	4	4	4	4	4	
3	3	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
4X	4X	5X	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	
5X	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	
6	6	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
7	7	4	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
8	8	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
9	9	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
10	10	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
11X	11X	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
12X	12X	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
13	13	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
14	14	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
15	15	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
16	16	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
17X	17X	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
18X	18X	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
19X	19X	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
20	20	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
21	21	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
22	22	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
23	23	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
24	24	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
25X	25X	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
26X	26X	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
27	27	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
28	28	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
29	29	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
30	30	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
AVE	2.2	2.2	2.0	3.0	3.2	2.7	2.4	2.1	1.9	2.0	2.1	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		
N	30	30	30	30	30	30	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	
MAX	5	5	5	4	6	6	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4

RUN DATE 01/10/84

APPENDIX IV

CALIFORNIA AIR RESOURCES BOARD
BASIC TAB REPORT

POLLUTANT : 42401 : SULFUR DIOXIDE
 COLLECTION METHOD : 20 : INSTRUMENTAL
 ANALYSIS METHOD : 40 : PULSED FLUORESCENCE
 UNITS : ppm

AIR BASIN : 09 : SAN JOAQUIN VALLEY
 STATION : 3400560 : VTSALTA-CHIPICH STREET
 AGENCY : A : ARB-ATMOSPHERIC SURVEY
 PROJECT : 11 : POPULATION ORIENTED
 DAY : 1983 : MAY

HOUR (PST)

	DAY	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Avg	MAX	MIN	
	1X	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	7X	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	8X	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	14X	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	15X	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	21X	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	22X	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	28X	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	29X	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	30X	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Avg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
	N	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	
	MAX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	MIN	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

APPENDIX IV (Cont'd.)

CALIFORNIA AIR RESOURCES BOARD
BASIC TAB REPORT

POLLUTANT : 42401 : SULFUR DIOXIDE
COLLECTION METHOD : 20 : INSTRUMENTAL
ANALYSIS METHOD : 40 : PULSED FLUORESCENCE
UNITS : ppm

AIR BASIN : 09 : SAN JOAQUIN VALLEY
STATION : 5400568 : VISALIA-CHURCH STREET
AGENCY : A : ARB-ATMOSPHERIC SURV
PROJECT : 11 : POPULATION CRIMINATED
JUNE : 1983

DAY	HOUR (PST)																								MAXIMUM N CONC HR #	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AVG CONC	
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
3X	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
5X	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
11X	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
12X	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
13X	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
18X	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
19X	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
24X	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
25X	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
26X	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
Avg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
n	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	
May	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
RUN DATE	01/10/84	01/10/84	01/10/84	01/10/84	01/10/84	01/10/84	01/10/84	01/10/84	01/10/84	01/10/84	01/10/84	01/10/84	01/10/84	01/10/84	01/10/84	01/10/84	01/10/84	01/10/84	01/10/84	01/10/84	01/10/84	01/10/84	01/10/84	01/10/84		